



# Information Seeking Behavior on COVID-19 Among Older Adults: A Cross-Sectional Study in Northern Iran

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## Abstract

This study aimed to assess the information-seeking behavior about COVID-19 among older adults in northern Iran. Two hundred-fifty three older adults living in Rasht, northern Iran, were enrolled in a cross-sectional study. Most older adults obtained information about COVID-19 from television, friends, and acquaintances. They relied less on special patient associations and the Ministry of Health telephone system. The use of social networks, the Ministry of Health telephone system, the Ministry of Health text message system, and friends and acquaintances for obtaining information about COVID-19 were significantly higher in people aged 60 to 70 years than in people aged >70 years. The use of newspapers/magazines to get information about COVID-19 was significantly higher in men than women. The use of websites, social networks, physicians, other health care workers, friends and acquaintances, newspapers/magazines, and special patients' associations for obtaining information about COVID-19 was significantly higher in people with tertiary education than in others. Older adults were more satisfied receiving information about COVID-19 from nurses and physicians. Therefore, it is recommended that policymakers and health managers pay special attention to developing health programs and social media programming to educate older adults about COVID-19 and access to the right media for accurate information.

## Keywords

information-seeking behavior, information literacy, COVID-19, older adults, Iran

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## Introduction

From December 2019 to the present, the COVID-19 pandemic has led to a global public health care emergency (Emami Zeydi et al., 2021; Ghorbani Vajargah et al., 2022; Javadi-Pashaki, Ghazanfari, & Karkhah, 2021; Javadi-Pashaki, Ghazanfari, Miri, et al., 2021; Karkhah et al., 2020; Mobayen et al., 2022). The main route of transmission of this virus is human-to-human through droplets from coughing and sneezing (Emami Zeydi et al., 2021; Monfared et al., 2021). According to the World Health Organization, a total of 258,164,425 confirmed cases of COVID-19 had been identified worldwide by November 24, 2021, out of which 5,166,192 resulted in death. A total of 7,230,882 confirmed cases of COVID-19 had been identified in Iran by May 23, 2022, out of which 141,293 resulted in death (World Health Organization). Although people in all age

groups are prone to COVID-19, previous evidence has shown that older adults with comorbidities have higher

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mortality and poorer prognosis (Huang et al., 2020; Wang, Hu, et al., 2020). In addition, evidence has shown that older age is the most important predictor of mortality in patients with COVID-19 (Perrotta et al., 2020). Therefore, preventive measures should be considered to prevent this disease in older adults (Chang et al., 2014 ; Perrotta et al., 2020; Turner et al., 2018 ).

One of the most effective strategies to prevent COVID-19 is providing education and increasing people's knowledge about the disease. Today, people's level of knowledge and awareness, especially older adults, about COVID-19 can be increased by using information-seeking behavior, making use of health care workers, friends and acquaintances, and social media (Wong et al., 2021). Previous evidence suggests that people use social networks such as Twitter, Facebook, Instagram, LinkedIn, blogging platforms, WeChat, and WhatsApp to obtain health information (Gong & Verboord, 2020; Swoboda et al., 2018). The Internet is the fastest-growing health information source; however, people often distrust the information they find online due to incorrect or conflicting information. Hence, health care workers are the most authoritative source of health information (Gong & Verboord, 2020; Swoboda et al., 2018). A study in Taiwan found that 80% of participants, especially older adults, received information about COVID-19 from online social media (Ko et al., 2020). Another study in the Netherlands found that the most important information-seeking behavior for health was the Internet (43.8%), magazines (36.2%), and health care workers (17.1%), respectively (Medlock et al., 2015).

Older adults are at high risk of contracting and dying from COVID-19 due to weaker immune systems and comorbidities such as diabetes and hypertension. Previous evidence regarding the information-seeking behavior of COVID-19 among older adults is limited. Therefore, due to the importance of education and increased knowledge and awareness of COVID-19 among older adults, this study aimed to assess the information-seeking behavior about COVID-19 among older adults in northern Iran.

## Theoretical Framework and Literature Review

### *Theoretical Framework*

The search for health information to improve health by many people is inevitable. If this search is done by patients to promote health, it can be an important factor in health-related decisions. This search is done for different purposes. Health information seeking behaviors include the search for information about diseases, health-related activities, and health-threatening factors performed by an individual (Zare-Farashbandi & Lalazaryan, 2014). Concepts related to information seeking behaviors in patients can include the type and

extent of the health information sought, sources associated with the source of information, and the personal characteristics of the searcher, such as age, gender, income, and level of education (Wang et al., 2013; Zare-Farashbandi & Lalazaryan, 2014). Previous models and theories related to information-seeking behavior are effective in determining how to assess and analyze information-seeking behavior in older adults in the present study (Wang et al., 2013; Zare-Farashbandi & Lalazaryan, 2014). Obviously, the implementation of all research should be based on models and theories.

### *Literature Review*

Various models of information-seeking behaviors have been described in the literature (Lambert & Loiselle, 2007; Zare-Farashbandi & Lalazaryan, 2014). Based on a review study that examined models and theories of information retrieval behaviors, Ferimuth et al. in 1975 proposed a model for acquiring health information by studying the Cancer Information Services (CSI). This model consists of six steps: (1) stimulus, (2) information goal setting, (3) cost-benefit analysis of search, (4) search behavior, (5) information evaluation, and (6) decision point on the adequacy of the information. Another model is Johnson's comprehensive model of information seeking. This model was created for women seeking information related to mammography. In Johnson's Comprehensive Model of information seeking, four factors were influential in information retrieval. These include (1) demographic factors, (2) direct experiences of people, (3) salience, and (4) beliefs of people. Another proposed model is the Enz's Information-Seeking Model, which describes collected information as part of the decision-making process. It consists of six steps that include: (1) Information seeking stimulus, (2) Setting information goals, (3) Decision making regarding whether to actively seek information, (4) search behavior, (5) Information acquisition and codification, and (6) Decision making based on the adequacy of acquired information (Zare-Farashbandi & Lalazaryan, 2014).

## Method

### *Study Design and Subjects*

Two hundred fifty-three older adults living in Rasht, northern Iran, were enrolled in a cross-sectional study. Multiple linear regression analysis was used to determine the sample size in this study. As a rule of thumb in regression analysis, at least 20 subjects should be selected for each independent (predictor) variable (Tabachnick et al., 2007). Due to the presence of nine independent variables in the present study, at least 180 older adults were selected, with a sample attrition of 20%. Data were collected using stratified random sampling from June to October 2021. Rasht has nine

telecommunication centers and 40 prefixes. Each telecommunication center has one to six prefixes. Each telecommunication center was considered a stratum, and sampling inside each stratum was conducted randomly and systematically. Phone calls were placed on phone numbers to ascertain if there were older adults within the families. In the absence of older adults in the family, a digit was added to the last digit of the dialed telephone number, and the contact number was called. If they did not answer the first phone call, the call was repeated up to three times. Individuals over 60 with cognitive abilities to engage in verbal and auditory communications were included in the study, while those who could not communicate appropriately were excluded. The cognitive abilities of older adults were assessed using the Abbreviated Mental Test Score (AMTS). Older adults who scored at least seven on the AMTS tool were included in the study. Participants with incomplete answers to the questionnaire items were excluded from the present study.

### Data Collection

This tool evaluates the usage and satisfaction rate of information-seeking behavior about COVID-19 among older adults. Data were collected using a two-part checklist, including individual and social characteristics and information seeking behavior about COVID-19. Personal and social characteristics of participants, such as age, sex, marital status, place of residence, level of education, job, number of family members, and economic situation, were collected. The checklist of information-seeking behavior about COVID-19 in older adults included 12 ten-choice items such as websites, social networks (including Facebook, Instagram, Twitter, WhatsApp, Line, Viber, YouTube, Tumblr, Google+, Skype, and LinkedIn), physicians, nurses, other health care workers, Ministry of Health telephone system, Ministry of Health text message system, friends and acquaintances, television, radio, newspaper/magazine, and special patients' association. The Ministry of Health's text message system is an automatic text message system designed by the Ministry of Health of Iran to provide people with up-to-date and reliable information about COVID-19. Also, the Ministry of Health telephone system is a telephone system designed by the Ministry of Health of Iran to provide people with up-to-date and reliable information about COVID-19. Data was gathered using a telephone interview, and participants responded to each item using a 10-choice Likert scale from never (score of 0) to always (score of 10). Finally, the mean score of each item in the participants was calculated and compared with other items.

### Statistical Analysis

SPSS for Windows, version 16.0 (SPSS Inc., Chicago, IL, USA), was used for statistical analysis. Quantitative

**Table 1.** Individual and Social Characteristics of Older Adults ( $n = 253$ ).

	Mean (SD) or $n$ (%)
Age (years)	68.34 (SD = 6.80)
60–70	178 (70.36)
>70	75 (29.64)
Sex	
Male	131 (51.78)
Female	122 (48.22)
Marital status	
Single	38 (15.02)
Married	215 (84.98)
Place of residence	
Urban	251 (99.21)
Rural	2 (0.79)
Level of education	
Illiterate	48 (18.97)
Less than diploma or diploma	169 (66.80)
Tertiary education	36 (14.23)
Job	
Employee	1 (0.39)
Retired	122 (48.22)
Housewife	98 (38.74)
Freelance	32 (12.65)
Number of family members	2.53 (SD = 0.91)
1	18 (7.12)
2	129 (50.99)
3	71 (28.06)
4	25 (9.88)
5	10 (3.95)
Economic situation	
Low	30 (11.86)
Moderate	219 (86.56)
High	4 (1.58)
How to live	
With wife and family	234 (92.49)
Alone	19 (7.51)

Note. Data are presented as number (percentage) and mean (standard deviation). SD = standard deviation.

and qualitative variables were presented using mean, standard deviation, and numbers (percentages). An independent  $t$ -test was used to assess the relationship between age, sex, usage rate, and information-seeking behavior about COVID-19 among older adults. One-way ANOVA test was used to evaluate the relationship between the level of education and information-seeking behavior about COVID-19 among older people. The significance level for all statistical tests was considered  $P < .05$ .

## Results

### Participants

A total of 253 older people were included in the present study. The mean age of participants was 68.34 ( $SD = 6.80$ ). Of the total older adults who participated in the study, 51.78% were male, 84.98% were married,

**Table 2.** Information Seeking Behavior About COVID-19 Among Older Adults ( $n = 253$ ).

Statement	Likert scale				Mean (SD)
	High (7–10)	Moderate (4–6)	Low (1–3)	No (0)	
<b>Usage rate</b>					
1 Website	12 (4.74)	14 (5.53)	1 (0.40)	226 (89.33)	0.68 (SD = 2.08)
2 Social networks	38 (15.02)	37 (14.62)	7 (2.77)	171 (67.59)	2.19 (SD = 3.51)
3 Physicians	42 (16.60)	28 (11.07)	11 (4.35)	172 (67.98)	2.17 (SD = 3.52)
4 Nurses	20 (7.91)	5 (1.98)	6 (2.37)	222 (87.74)	0.90 (SD = 2.65)
5 Other health care workers	15 (5.93)	12 (4.74)	14 (5.53)	212 (83.80)	0.92 (SD = 2.47)
6 Ministry of health telephone system	5 (1.98)	1 (0.39)	14 (5.53)	233 (92.10)	0.13 (SD = 0.69)
7 Ministry of health text message system	43 (17.00)	52 (20.55)	24 (9.49)	134 (52.96)	2.89 (SD = 3.62)
8 Friends and acquaintances	85 (33.60)	59 (23.32)	16 (6.32)	93 (36.76)	4.26 (SD = 3.78)
9 Television	177 (69.96)	48 (18.97)	10 (3.95)	18 (7.12)	7.69 (SD = 3.20)
10 Radio	34 (13.44)	10 (3.95)	8 (3.16)	201 (79.45)	1.56 (SD = 3.32)
11 Newspaper/magazine	8 (3.16)	9 (3.56)	10 (3.95)	226 (89.33)	0.55 (SD = 1.85)
12 Special patients association	3 (1.19)	0 (0.00)	2 (0.79)	248 (98.02)	0.11 (SD = 0.89)
<b>Satisfaction rate</b>					
1 Website ( $n = 27$ )	10 (37.04)	10 (37.04)	6 (22.22)	1 (3.70)	5.74 (SD = 2.85)
2 Social networks ( $n = 82$ )	38 (46.34)	34 (41.46)	6 (7.32)	4 (4.88)	6.30 (SD = 2.69)
3 Physicians ( $n = 82$ )	60 (73.17)	19 (23.17)	2 (2.44)	1 (1.22)	7.95 (SD = 2.41)
4 Nurses ( $n = 31$ )	26 (83.87)	4 (12.90)	1 (3.23)	0 (0.00)	8.71 (SD = 2.19)
5 Other health care workers ( $n = 41$ )	29 (70.73)	9 (21.95)	3 (7.32)	0 (0.00)	7.63 (SD = 2.51)
6 Ministry of health telephone system ( $n = 20$ )	11 (55.00)	1 (5.00)	3 (15.00)	5 (25.00)	3.83 (SD = 3.27)
7 Ministry of health text message system ( $n = 119$ )	51 (42.86)	42 (35.29)	22 (18.49)	4 (3.36)	5.94 (SD = 3.00)
8 Friends and acquaintances ( $n = 160$ )	80 (50.00)	63 (39.37)	16 (10.00)	1 (0.63)	6.56 (SD = 2.39)
9 Television ( $n = 234$ )	156 (66.67)	53 (22.65)	19 (8.12)	6 (2.56)	7.37 (SD = 2.69)
10 Radio ( $n = 52$ )	36 (69.23)	11 (21.15)	5 (9.62)	0 (0.00)	7.69 (SD = 2.61)
11 Newspaper/magazine ( $n = 27$ )	11 (40.74)	12 (44.44)	4 (14.82)	0 (0.00)	6.26 (SD = 2.75)
12 Special patients association ( $n = 5$ )	3 (60.00)	1 (20.00)	1 (20.00)	0 (0.00)	6.20 (SD = 2.77)

Note. Data are presented as number (percentage) and mean (standard deviation). SD = standard deviation.

99.21% were urban, 66.80% had a degree less than diploma or diploma, 48.22% were retired, 86.56% had a moderate economic status, and 92.49% lived with wife and family. Individual and social characteristics of older people are presented in Table 1.

### The Usage Rate of Information-Seeking Behavior About COVID-19 Among Older Adults

As presented in Table 2 and Figure 1, 7.69% of older adults obtained information about COVID-19 through the television, friends and acquaintances (4.26), and the Ministry of Health text message system (2.89), respectively. However, less used media by older people to obtain information about COVID-19 were special patients association (0.11), the Ministry of Health telephone system (0.13), and newspapers/magazines (0.55), respectively.

### Relationship Between Age, Sex, and Level of Education With the Usage Rate of Information-Seeking Behavior About COVID-19 Among Older Adults

As shown in Table 3, the use of social networks ( $P < .001$ ), Ministry of Health telephone system ( $P = .011$ ), Ministry of Health text message system ( $P = .036$ ), and friends and acquaintances ( $P = .003$ ) for obtaining information about COVID-19 were significantly higher in people aged 60 to 70 years compared with people aged  $>70$  years.

The use of newspapers/magazines to obtain information about COVID-19 was significantly higher in men than women ( $P = .005$ ). However, there was no statistically significant difference in using other methods between men and women ( $P > .05$ ).

Use of websites ( $P < .001$ ), social networks ( $P < .001$ ), physicians ( $P = .028$ ), other health care workers ( $P = .041$ ), friends and acquaintances ( $P = .007$ ), newspapers/

**Table 3.** Relationship Between Age, Sex, and Level of Education With the Usage Rate of Information Seeking Behavior About COVID-19 Among Older Adults.

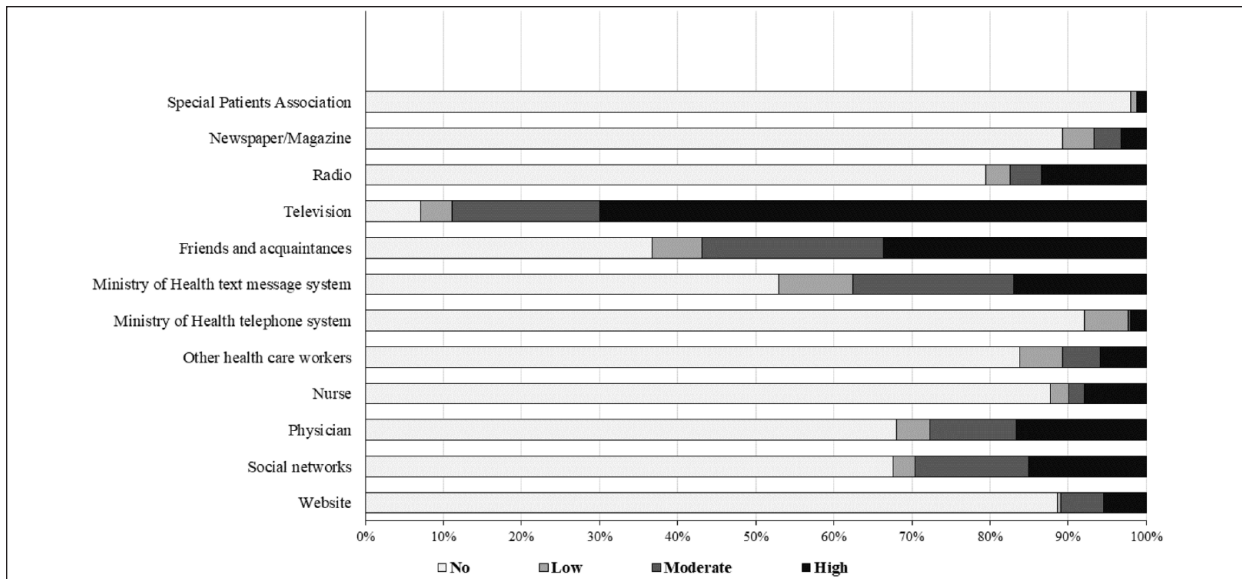
	Age group		Sex		Level of education					Tertiary education	P <sup>b</sup>
	60–70 years	>70 years	Male	Female	P <sup>a</sup>	Illiterate	diploma or less				
1	Website	0.82 (2.30)	0.36 (1.40)	0.80 (2.30)	0.56 (1.83)	.352	0 (0)	0.63 (2.05)	1.83 (3.01)	<.001	
2	Social networks	2.70 (3.70)	1.00 (2.71)	2.56 (3.76)	1.80 (3.19)	.080	0 (0)	2.25 (3.47)	4.83 (4.14)	<.001	
3	Physicians	2.25 (3.58)	1.97 (3.40)	2.13 (3.47)	2.20 (3.60)	.866	1.00 (2.50)	2.41 (3.66)	2.56 (3.79)	.028	
4	Nurses	0.79 (2.51)	1.15 (2.98)	0.82 (2.52)	0.98 (2.79)	.618	0.71 (2.35)	0.75 (2.46)	1.86 (3.60)	.116	
5	Other health care workers	1.07 (2.62)	0.55 (2.03)	1.11 (2.75)	0.71 (2.11)	.201	0.71 (2.47)	0.72 (2.06)	2.11 (3.68)	.041	
6	Ministry of health telephone system	0.35 (1.47)	0.05 (0.28)	0.28 (1.32)	0.24 (1.17)	.776	0.06 (0.32)	0.22 (1.14)	0.72 (2.15)	.122	
7	Ministry of health text message system	3.20 (3.60)	2.16 (3.60)	3.24 (3.65)	2.52 (3.57)	.118	1.94 (3.51)	2.98 (3.57)	3.78 (3.81)	.061	
8	Friends and acquaintances	4.71 (3.76)	3.20 (3.62)	4.19 (3.76)	4.34 (3.82)	.748	3.02 (3.64)	4.33 (3.81)	5.61 (3.36)	.007	
9	Television	7.71 (3.17)	7.65 (3.29)	7.76 (3.10)	7.61 (3.31)	.713	7.58 (3.58)	7.75 (3.04)	7.56 (3.46)	.915	
10	Radio	1.63 (3.40)	1.39 (3.14)	1.50 (3.23)	1.61 (3.43)	.791	1.29 (3.11)	1.53 (3.29)	2.06 (3.77)	.570	
11	Newspaper/magazine	0.60 (1.90)	0.44 (1.73)	0.85 (2.27)	0.22 (1.17)	.005	0 (0)	0.49 (1.75)	1.58 (2.91)	<.001	
12	Special patients association	0.14 (1.05)	0.03 (0.23)	0.15 (1.08)	0.07 (0.64)	.480	0 (0)	0.06 (0.56)	0.47 (2.01)	.026	

Note. Data are presented as number (percentage) and mean (standard deviation).

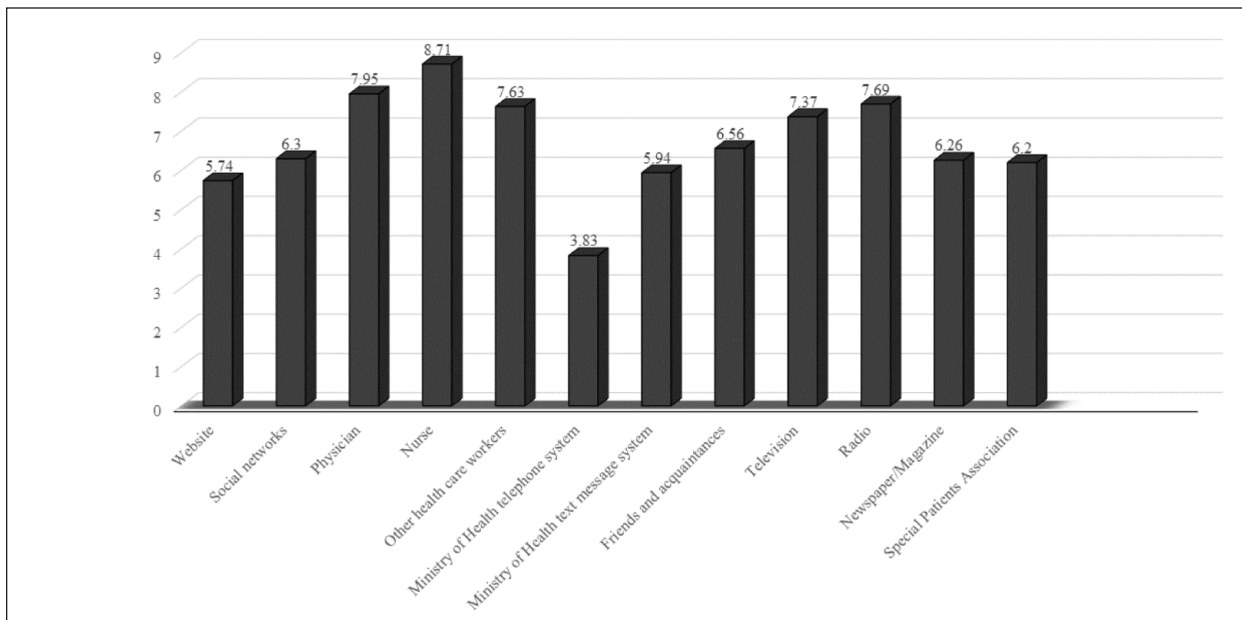
<sup>a</sup>Independent t test.

<sup>b</sup>One-way ANOVA.





**Figure 1.** The usage rate of information seeking behavior about COVID-19 among older adults.



**Figure 2.** Satisfaction rate of information seeking behavior about COVID-19 among older adults.

magazines ( $P < .001$ ), and special patients association ( $P = .026$ ) for obtaining information about COVID-19 were significantly higher in people with tertiary education compared with other people.

### *The Satisfaction Rate of Information-Seeking Behavior About COVID-19 Among Older Adults*

As presented in Table 2 and Figure 2, older adults were more satisfied with obtaining information about COVID-19 from nurses (8.71), physicians (7.95), and radio (7.69), respectively. However, older adults were less satisfied with obtaining information about COVID-19

than the Ministry of Health telephone system (3.83), websites (5.74), and the Ministry of Health text message system (5.94), respectively.

### **Discussion**

Based on the present study's findings, older adults obtained information about COVID-19 from television, friends and acquaintances, and the Ministry of Health text message system.

As presented in this study, older adults obtain information about COVID-19 more from television, friends and acquaintances, and the Ministry of Health

text message system. However, older people got less information about COVID-19 from the special patient's association, the Ministry of Health telephone system, and newspapers/magazines. Consistent with these findings, a study in the USA (Lund & Ma, 2022) found that older adults are more likely to receive health information about COVID-19 through friends and acquaintances and the television. Another study in China (Chen, Gao, et al., 2020) found that people prefer to use traditional sources such as radio, television, newspapers, and friends and acquaintances to obtain health information about COVID-19 compared to modern sources. Inconsistent with the present study's findings, a study in China (Zhao et al., 2020) found that websites are an important source of health information about COVID-19 in older adults. These discrepancies may be due to differences in information sources, facilities, and personal preferences of older adults based on cultural, economic, and social assumptions in different countries (Chen, Gao, et al., 2020; Lund & Ma, 2022; Zhao et al., 2020). Therefore, it is very important to provide health information about COVID-19 in the elderly based on accessibility, resources, and facilities available (Liu, 2020). The health information received from online and news media should be convincing enough to change the preventive behaviors of older adults against COVID-19.

Given the growing interest in television as a medium that has attracted the attention of older adults in search of health information seeking in Iran, it is suggested that a variety of television programs be made available to the public to promote health information seeking. Continuing the activity of the SMS system during the current epidemic and subsequent epidemics, depending on the type of epidemic and how to deal with it, can also affect the transmission of possible incorrect information received through friends and acquaintances. On the other hand, receiving information through associations, telephone systems, and newspapers/magazines has been the least behavior. It is suggested that health policymakers and managers provide facilities and budget and develop an appropriate program to improve these methods practically and cost-effectively (Pourrazavi et al., 2022).

As indicated in this study, older adults were less satisfied with obtaining information about COVID-19 from the Ministry of Health's telephone system, websites, and text messaging system. Therefore, policymakers and governments can motivate older adults by providing them with up-to-date and accurate information on those media avenues they described as preferences. It is very important that people are satisfied with the performance of governments in the COVID-19 pandemic. Satisfaction with government performance can increase people's precautionary measures and reduce infections (Chen, Gao, et al., 2020). Also, radio is very popular as a traditional, cheap, and highly accessible medium among older adults in Iran. However, the acceptance of this communication channel is not the same in all countries.

For example, a longitudinal study in China (Wang, Pan, et al., 2020) showed that the use of radio to broadcast information about COVID-19 was associated with increased anxiety and depression in the general population. Therefore, it is suggested that more studies be conducted to determine the preferences and satisfaction of older adults with information-seeking behavior about COVID-19 in different countries.

### *Limitations*

The present study had several limitations. The main limitation of the present study was the lack of perception and validity of the response of some items due to the age of the participants. Another limitation was the lack of evaluation of the correlation between digital health literacy and aspects related to information-seeking behavior. In addition, the present study mainly focused on the sources used by older adults to search for information. However, more dimensions of information-seeking behavior, such as attitudes and social norms, were not investigated.

### *Recommendations for Future Research*

It is suggested that future researchers conduct qualitative studies to assess factors related to the usage and satisfaction of older adults with information-seeking behavior about COVID-19. In the present study, the usage and satisfaction of older people with information-seeking behavior about COVID-19 were assessed using telephone interviews, which may lead to sampling bias. It is recommended that future researchers employ field study approaches to determine the usage and satisfaction of older adults with information-seeking behavior about COVID-19 using face-to-face interviews.

### *Implications for Health Management*

Based on the present study's findings, the most information-seeking behavior about COVID-19 among older adults included the use of television, friends and acquaintances, and the Ministry of Health text message system. Therefore, health managers and policymakers need to develop programs to improve older people's knowledge of COVID-19 using the participation of nurses and physicians through traditional media such as television and radio as reliable sources for delivering up-to-date and credible health information.

### **Conclusions**

In conclusion, the most information-seeking behavior about COVID-19 was among older adults, using television, friends and acquaintances, and the Ministry of Health text message systems. The lowest information-seeking behavior about COVID-19 was among older people, including the special patients' association, the

Ministry of Health telephone system and newspaper/magazines. The highest satisfaction rate of information-seeking behavior about COVID-19 was among older adults, including nurses, physicians, and radio. The lowest satisfaction rate of information-seeking behavior about COVID-19 was among older adults, including the Ministry of Health telephone system, the website, and the text message system. Therefore, it is recommended that policymakers and health managers pay special attention to developing health programs and social media programming to educate older adults about COVID-19.

### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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### Ethics Statement

The present research was confirmed by the ethics committee of Guilan University of Medical Sciences (IR.GUMS.REC.1400.120). The objectives of the study were explained to the participants and written informed consent was obtained from them.

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